

ATTORNEY DOCKET NO.
062986.0186
(901.00)

PATENT APPLICATION
09/609,046

1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: D'Arcy M. Tyrrell III, et al.
Serial No.: 09/609,046
Filing Date: June 30, 2000
Confirmation No.: 2977
Group Art Unit: 2153
Examiner: Aaron N. Strange
Title: METHOD AND SYSTEM FOR DISTRIBUTED
RENDERING

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

APPEAL BRIEF

Applicant has appealed to the Board of Patent Appeals and Interferences from the Advisory Action issued May 9, 2007 and the Final Action issued January 26, 2007 finally rejecting Claims 1-29. In response to the Notice of Panel Decision from Pre-Appeal Brief Review issued August 24, 2007, Applicant respectfully submits herewith its brief on appeal.

REAL PARTY IN INTEREST

The present Application was assigned to Silicon Graphics, Inc., a Delaware corporation, as indicated by an assignment from inventor D'Arcy M. Tyrrell III and recorded on May 4, 2001 in the Assignment Records of the United States Patent and Trademark Office at Reel 011775, Frames 0581-0584.

RELATED APPEALS AND INTERFERENCES

There are no known appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in this pending appeal.

STATUS OF CLAIMS

Claims 1-29 stand rejected pursuant to a Final Action issued January 26, 2007. Claims 1-29 are all presented for appeal.

STATUS OF AMENDMENTS

A Response to Examiner's Action was filed on July 10, 2003 in response to an Office Action issued April 10, 2003. Claims 1, 3, 4, 7, 8, 14, 16-24, and 26 were amended. A Request for Continued Examination was filed on January 6, 2004 in response to a Final Action issued October 6, 2003. Claims 1, 3, 4, 8, 14, 16, 21, and 26 were amended. A Response to Examiner's Action was filed on September 4, 2004 in response to an Office Action issued May 5, 2004. Claims 1, 3, 4, 8, 14, and 21 were amended. A Response to Examiner's Final Action was filed on March 30, 2005 in response to a Final Action issued February 2, 2005. Claims 1, 8, 14, and 21 were amended. A Request for Continued Examination was filed on June 2, 2005 in response to an Advisory Action issued May 6, 2005. The amendments to 1, 8, 14, and 21 were repeated for consideration. A Response to Examiner's Action was filed on November 30, 2005 in response to an Office Action issued August 31, 2005. Claims 1, 2, 8, 14, and 21 were amended. A Response to Examiner's Final Action was filed on April 17, 2006 in response to a Final Action issued February 15, 2006. Claims 1, 8, 14, and 21 were amended. A Request for Continued Examination was filed on May 8, 2006 in response to an Advisory Action issued April 25, 2006. The amendments to 1, 8, 14, and 21 were repeated for consideration. A Response to Examiner's Action was filed on November 13, 2006 in response to an Office Action issued August 11, 2006. Claims 1, 8, 14, and 21 were amended. A Response to Examiner's Final Action was filed on April 26, 2007 in response to a Final Action issued January 26, 2007. No further amendments were made to the claims. A Notice of Appeal and Request for Pre-Appeal Brief Review were filed on May 29, 2007 in response to an Advisory Action issued May 9, 2007. A Notice of Panel

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PATENT APPLICATION
09/609,046

4

Decision from Pre-Appeal Brief Review issued on August 24, 2007 stating that the appeal is to proceed to the Board of Patent Appeals and Interferences.

SUMMARY OF CLAIMED SUBJECT MATTER

With respect to Independent Claim 1, a computerized method for rendering images is provided. The method includes receiving from a client 32 a render job having an associated job profile 88 and a plurality of frames 84 in an animation sequence. (See FIGURE 1 and page 9, lines 16-25). Via a communications medium, a first frame 84 of the animation sequence is distributed to a first one of a plurality of render servers 26 and a second frame 84 of the animation sequence is distributed to a second one of the plurality of render servers 26 based at least in part on the job profile 88, where the first and second frames 84 are different. (See FIGURE 1 and page 9, lines 28-29). The first and second frames 84 are rendered concurrently at the first and second render servers 26. (See FIGURE 1 and page 13, lines 8-11). The rendered first and second frames 84 are forwarded to a network storage system 28 for retrieval by the client 32. (See FIGURE 1 and page 33, line 30, to page 34, line 1). One or more samples of the rendered first or second frames 84 for the render job are provided to the client 32 prior to completion of rendering the first or second frame 84 by the first and second servers 26 and an input is received from the client 32 in response to the one or more samples. (See FIGURE 1 and page 34, lines 1-7).

With respect to Independent Claim 8, a system 20 for rendering images is provided. The system 20 includes a resource database 22 comprising resource information regarding a plurality of render servers 26. (See FIGURE 1 and page 10, lines 22-31). A schedule server 24 is coupled to the plurality of render servers 26 via a communications medium. (See FIGURE 1 and page 11, lines 3-18). The schedule server 24 is operable to receive a render job from a client 32, where the render job has an associated job profile 88 and a plurality of image frames 84 in a sequence. (See FIGURE 1 and page 9, lines 16-25). The schedule server 24 is operable to distribute a first frame 84 of the sequence to a first one of a plurality of render servers 26 based on a comparison of the job profile and the resource information. (See FIGURE 1 and page 28-29). The schedule server 24 is operable to provide one or more samples of the rendered first frame 84 received from the first one of the plurality of render servers 26 for the render job to the client 32 prior to completion of rendering the first frame 84 by the first one of the plurality of render servers 26 and receive an input from the client 32 in response to the one or more samples. (See FIGURE 1 and page 34, lines 1-7).

With respect to Independent Claim 14, a system 600 for providing distributed rendering servers is provided. The system 600 includes a local rendering system 500 operable to receive from a client 504 a render job having a plurality of frames 508 in an animation sequence. (See FIGURE 11 and page 31, line 30, to page 32, line 17). At least one remote rendering system 502 has a plurality of remote render servers 570. (See FIGURE 11 and page 32 lines 27-31). The remote rendering system 502 is operable to receive from the local rendering system the render job. (See FIGURE 11 and page 33, lines 26-30). The remote rendering system 502 distributes a first frame 508 of the sequence to a first one of the plurality of remote render servers 570 and a second frame 508 of the sequence to a second one of the plurality of remote render servers 570, where the first and second frames are different. (See FIGURE 11 and page 37, lines 7-10). The first and second frames 508 are rendered concurrently at the first and second remote render servers 570. (See FIGURE 11, and page 13, lines 8-11). A result of the render job is returned to the local rendering system 500. (See FIGURE 11 and page 37, lines 11-15). The remote rendering system 502 is operable to provide one or more samples of the rendered first or second frames 84 for the render job to the local rendering system 500 prior to completion of rendering of the first or second frame 84 by the remote rendering system 502 and the remote rendering system 502 is operable to receive an input from the client 504 in response to the one or more samples. (See FIGURE 1 and page 34, lines 1-7).

With respect to Independent Claim 21, a computerized method for rendering images is provided. The method includes receiving a render job having a plurality of frames 84 in an animation sequence from a client 32 at a first rendering site 500. (See FIGURE 11 and page 31, line 30, to page 32, line 17). The render job is transferred from the first rendering site 500 to a second rendering site 502, where the second rendering site 502 is located remote from the first rendering site 500 and comprising a plurality of remote render servers 570. (See FIGURE 11 and page 33, lines 26-30). A first frame 508 of the sequence is distributed to a first one of the plurality of remote render servers 570 and a second frame 508 of the sequence to a second one of the plurality of remote render servers 570, where the first and second frames are different. (See FIGURE 11 and page 37, lines 7-10). The first and second frames 508 are rendered concurrently at the first and second remote render servers 570. (See FIGURE 11, and page 13, lines 8-11). One or more samples of the rendered first or second frames 508 for the render job are provided to the client 504 prior to completion of rendering of the first or second frames 508 by the first and second remote servers 570 and an input is received from the client 504 in response to the one or more samples. (See FIGURE 1 and page 34, lines 1-7).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 1-29 stand rejected under 35 U.S.C. §112, first paragraph, as containing subject matter not described in the specification.

2. Claims 1-29 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,192,388 issued to Cajolet in view of the "Distributed Parallel Volume Rendering on Shared Memory Systems" paper authored by Hancock.

ARGUMENT

1. Claims 1-29 stand rejected under 35 U.S.C. §112, first paragraph, as containing subject matter not described in the specification. Contrary to the Examiner's assertion, Applicant's specification clearly provides support for language of the claims. Support for the language of Claims 1-29 can be found at page 9, lines 19-29; page 11, lines 9-18; and page 34, lines 1-7. As disclosed in the passages above, a render job is represented by a render file storing one or more render frames. A schedule server may distribute frames to be rendered to several render hosts. The schedule server can track the progress of the render frames and communicate with the client. A sample of a render job may be provided prior to completion of the render job to the client. Since a frame is part of a render job, a sample of a rendered frame may be provided to the client from one render server prior to completion of a rendered frame from another render server. As a result, Applicant's specification provides clear support for the language of the claims. Therefore, Applicant respectfully submits that Claims 1-29 are in accordance with 35 U.S.C. §112, first paragraph.

2. Claims 1-29 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,192,388 issued to Cajolet in view of the "Distributed Parallel Volume Rendering on Shared Memory Systems" paper authored by Hancock. According to M.P.E.P. §2143, to establish a prima facie case of obviousness, three criteria must be met. First, there must be some suggestion or motivation to combine the references. Second, there must be a reasonable expectation of success. Third, the prior art combination of references must teach or suggest all the claim limitations. The Examiner has not established that any criteria for a prima facie case of obviousness has been met in this instance.

First, there is no objective reason provided by the Examiner to combine the Cajolet patent and the Hancock paper as proposed. The Examiner has failed to provide an objective reason that would have prompted a person of ordinary skill in the art to combine the Cajolet patent with the Hancock paper. The Cajolet patent is directed to a providing complete rendered image data to a problem dispatcher for accumulation and storage. The Hancock paper is directed to a continuously progressive refinement scheme for fast preview but no interaction. The Examiner has not cited any objective reason showing any capability for the Cajolet patent to be combined with the Hancock paper to operate in a different manner than what is disclosed therein. The Examiner merely states that one of ordinary skill in the art would be motivated to provide the feature of the Hancock paper missing from the Cajolet patent. The rationale provided by the Examiner for the proposed combination is purely subjective conjecture and speculation with no objective reasoning being provided to support the proposed combination of the references as has been proposed. The Examiner is merely taking bits and pieces of

isolated subject matter in an improper hindsight attempt at reconstructing the claimed invention. The Examiner merely provides baseless and subjective conclusory "it would have been obvious" statements using improper hindsight reconstruction without any support for such conclusory statements from the point of view of those skilled in the art. A statement that modifications of the prior art to meet the claimed invention would have been well within the ordinary skill of the art at the time the claimed invention was made because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. See M.P.E.P. 2143.01. Since the Examiner has used the claim language in a hindsight attempt to support the combination of the references and has not provided any proper reasoning, let alone objective reasoning for combining the Hancock paper with the Cajolet patent, the burden to establish the first criteria of a prima facie case of obviousness has not been met.

Second, a reasonable expectation of success has not been shown by the Examiner. The modification of the Cajolet patent would not be capable of performing the operation required by the claimed invention. There is no showing by the Examiner that the functions of the Cajolet patent would be able to operate with the feature of the Hancock paper. There has also been no showing that the proposed combination would even be able to perform the functionality of the claimed invention. The proposed combination attempts to change the operation of the Cajolet patent where it has not been shown to be capable of operating according to any degree of predictability. For operation, the system in the Cajolet patent discloses that a

complete rendered image data must be provided to the problem dispatcher for accumulation and storage. If only samples are provided, the problem dispatcher would think that the samples are complete rendered images and store them as such. Thus, the Examiner, without the improper hindsight look through the claimed invention, has not addressed how the proposed combination of the cited references would have any success whatsoever let alone a reasonable expectation of success. Therefore, Applicant respectfully submits that the Examiner has failed to establish the second criteria for a prima facie case of obviousness.

Third, the Examiner has not shown that the proposed Cajolet - Hancock combination teaches or suggests all of the claim limitations. For example, Independent Claims 1, 8, 14, and 21 recite in general an ability to provide one or more samples of the rendered first or second frames for the render job to the client prior to completion of rendering the first or second frame by the first and second servers and receive an input from the client in response to the one or more samples. By contrast, as shown in col. 10, lines 34-37, of the Cajolet patent, the assisting computer completes its portion of the task and then returns its results to the problem dispatcher. There is no disclosure in the Cajolet patent that its assisting computer provides samples of rendered frames prior to completing its portion of the render job as required by the claimed invention. Thus, the Cajolet patent has no capability to provide one or more samples of the rendered first or second frames for the render job to the client prior to completion of rendering the first or second frames by the first and second servers as required by the claimed invention. In addition, the Cajolet patent is not capable of receiving an input from the client in response to the one or more samples as the

Cajolet patent has no capability to provide samples of rendered frames. The portion of the Cajolet patent cited by the Examiner relating to receipt of client input merely discusses assigning uncompleted portions of a task to an available assisting computer when an originally assigned assisting computer has been interrupted. Thus, the portion of the Cajolet patent cited by the Examiner is not related at all to receipt of client input let alone in response to the one or more samples as required in the claimed invention. Moreover, the Hancock, et al. paper merely discloses providing a progressive view of the rendered image. The Hancock paper discloses a continuously progressive refinement scheme for fast preview but no interaction. As a result, the Hancock, et al. patent is not capable of receiving an input from the client in response to the one or more samples as provided by the claimed invention. Therefore, Applicant respectfully submits that Claims 1-29 are patentably distinct from the proposed Cajolet - Hancock, et al. combination.

Thus, the Examiner has failed to establish the third criteria for a prima facie case of obviousness. As a result of the improper combination of the references, the lack of any expectation of success for the combination, and the lack of disclosure in the patents being combined by the Examiner, there is an insufficient basis to support the rejection of the claims.

CONCLUSION

Applicant has clearly demonstrated that the present invention as claimed is clearly distinguishable over all the art cited of record, either alone or in combination, and satisfies all requirements under 35 U.S.C. §§101, 102, and 103, and 112. Therefore, Applicant respectfully requests the Board of Patent Appeals and Interferences to reverse the final rejection of the Examiner and instruct the Examiner to issue a Notice of Allowance of all pending claims.

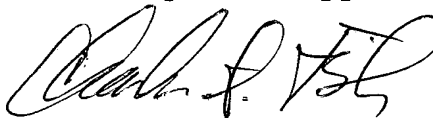
Please charge Deposit Account No. 02-0384 of BAKER BOTTS L.L.P. an amount of \$510.00 to satisfy the appeal brief fee of 37 C.F.R. §41.20(b)(2).

The Commissioner is hereby authorized to charge any fees or credit any overpayments associated with this Application to Deposit Account No. 02-0384 of BAKER BOTTS L.L.P.

Respectfully submitted,

BAKER BOTTS L.L.P.

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CLAIMS APPENDIX

1. (Previously Presented) A computerized method for rendering images, comprising:

receiving from a client a render job having an associated job profile and a plurality of frames in an animation sequence;

distributing via a communications medium a first frame of the animation sequence to a first one of a plurality of render servers and a second frame of the animation sequence to a second one of the plurality of render servers based at least in part on the job profile, the first and second frames being different;

rendering the first and second frames concurrently at the first and second render servers;

forwarding the rendered first and second frames to a network storage system for retrieval by the client;

providing one or more samples of the rendered first or second frames for the render job to the client prior to completion of rendering the first or second frame by the first and second servers;

receiving an input from the client in response to the one or more samples.

2. (Previously Presented) The method of Claim 1, wherein receiving from a client the render job comprises receiving the render job from a computer remote from the plurality of render servers.

3. (Previously Presented) The method of Claim 1, wherein distributing the first and second frames comprises distributing the first and second frames by a scheduler, the scheduler operable to determine which of the plurality of render servers are capable of rendering the first and second frames.

4. (Previously Presented) The method of Claim 3, wherein the scheduler is operable to determine which of the plurality of render servers are capable of rendering the first and second frames by accessing a database storing the capabilities of each of the plurality of render servers.

5. (Original) The method of Claim 4, wherein the capabilities database stores the type of rendering package associated with each of the plurality of render servers.

6. (Original) The method of Claim 4, wherein the capabilities database stores a processing status for each of the plurality of the render servers.

7. (Previously Presented) The method of Claim 1, and further comprising transmitting the rendered first and second frames to the client.

8. (Previously Presented) A system for rendering images, comprising:

a resource database comprising resource information regarding a plurality of render servers; and

a schedule server coupled to the plurality of render servers via a communications medium , the schedule server operable to receive a render job from a client, the render job having an associated job profile and a plurality of image frames in a sequence, the schedule server operable to distribute a first frame of the sequence to a first one of a plurality of render servers based on a comparison of the job profile and the resource information, the schedule server operable to provide one or more samples of the rendered first frame received from the first one of the plurality of render servers for the render job to the client prior to completion of rendering the first frame by the first one of the plurality of render servers, the schedule server operable to receive an input from the client in response to the one or more samples.

9. (Original) The system of Claim 8, wherein the resource information comprises the type of rendering package associated with each of the plurality of render servers.

10. (Original) The system of Claim 8, wherein the resource information comprises a processing status for each of the plurality of render servers.

11. (Original) The system of Claim 8, wherein the schedule server is operable to determine whether a particular one of the render servers is capable of rendering a particular render job.

12. (Original) The system of Claim 8, wherein the resource database further comprises resource information regarding a plurality of render hosts associated with respective ones of the render servers.

13. (Original) The system of Claim 12, wherein the resource information comprises hardware configuration information regarding the render hosts.

14. (Previously Presented) A system for providing distributed rendering servers comprising:

a local rendering system operable to receive from a client a render job having a plurality of frames in an animation sequence; and

at least one remote rendering system comprising a plurality of remote render servers and operable to:

receive from the local rendering system the render job;

distribute a first frame of the sequence to a first one of the plurality of remote render servers and a second frame of the sequence to a second one of the plurality of remote render servers, the first and second frames being different;

render the first and second frames concurrently at the first and second remote render servers; and

return a result of the render job to the local rendering system;

wherein the remote rendering system is operable to provide one or more samples of the rendered first or second frames for the render job to the local rendering system prior to completion of rendering of the first or second frame by the remote rendering system, wherein the remote rendering system is operable to receive an input from the client in response to the one or more samples.

15. (Original) The system of Claim 14, wherein the local rendering system comprises:

a plurality of render servers operable to render a render job having an associated job profile;

a resource database comprising resource information regarding the plurality of render servers; and

a schedule server coupled to the render server via a communications medium and operable to distribute the render job to one or more of a plurality of render servers based on a comparison of the job profile and the resource information.

16. (Previously Presented) The system of Claim 14, wherein the remote rendering system comprises:

a resource database comprising resource information regarding the plurality of render servers; and

a schedule server coupled to the remote render servers via a communications medium and operable to distribute the render job to at least the first and second remote render servers based on a comparison of the job profile and the resource information.

17. (Previously Presented) The system of Claim 16, wherein the resource information comprises the type of rendering package associated with each of the plurality of remote render servers.

18. (Previously Presented) The system of Claim 16, wherein the resource information comprises a processing status for each of the plurality of remote render servers.

19. (Previously Presented) The system of Claim 16, wherein the schedule server is operable to determine whether a particular one of the remote render servers is capable of rendering a particular render job.

20. (Previously Presented) The system of Claim 16, wherein the resource database further comprises resource information regarding a plurality of render hosts associated with respective ones of the remote render servers.

21. (Previously Presented) A computerized method for rendering images comprising:

receiving a render job having a plurality of frames in an animation sequence from a client at a first rendering site;

transferring the render job from the first rendering site to a second rendering site, the second rendering site located remote from the first rendering site and comprising a plurality of remote render servers;

distributing a first frame of the sequence to a first one of the plurality of remote render servers and a second frame of the sequence to a second one of the plurality of remote render servers, wherein the first and second frames are different;

rendering the first and second frames concurrently at the first and second remote render servers;

providing one or more samples of the rendered first or second frames for the render job to the client prior to completion of rendering of the first or second frames by the first and second remote servers;

receiving an input from the client in response to the one or more samples.

22. (Previously Presented) The method of Claim 21, and further comprising transmitting the rendered first and second frames to the client.

23. (Previously Presented) The method of Claim 21, and further comprising transmitting the rendered first and second frames from the second render site to the first render site.

24. (Previously Presented) The method of Claim 21, and further comprising storing the rendered first and second frames in a location accessible by the client.

25. (Original) The method of Claim 21, wherein the first rendering site comprises:

- a plurality of render servers operable to render a render job having an associated job profile;

- a resource database comprising resource information regarding the plurality of render servers; and

- a schedule server coupled to the render server via a communications medium and operable to distribute the render job to one or more of a plurality of render servers based on a comparison of the job profile and the resource information.

26. (Previously Presented) The method of Claim 21, wherein the second rendering site comprises:

a resource database comprising resource information regarding the plurality of render servers; and

a schedule server coupled to the remote render servers via a communications medium and operable to distribute the render job to at least the first and second remote render servers based on a comparison of the job profile and the resource information.

27. (Original) The method of Claim 21, and further comprising transferring files associated with the render job from the first site to the second site, the associated files being necessary to render the render job.

28. (Original) The method of Claim 27, wherein the associated files comprise a texture file.

29. (Original) The method of Claim 21, and further comprising notifying, by the second rendering site, the first rendering site when the render job has been rendered.

ATTORNEY DOCKET NO.
062986.0186
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PATENT APPLICATION
09/609,046

25

EVIDENCE APPENDIX

None

ATTORNEY DOCKET NO.
062986.0186
(901.00)

PATENT APPLICATION
09/609,046

26

RELATED PROCEEDINGS APPENDIX

None

ATTORNEY DOCKET NO.
062986.0186
(901.00)

PATENT APPLICATION
09/609,046

27

CERTIFICATE OF SERVICE

None